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Harmoniella campanaensis sp. nov. from central Chile

Hugo Madrid[1,2*], Daniela Torres[1] & Víctor Silva[2]

[1] *Center for Genomics and Bioinformatics, Mayor University &*

[2] *Science Faculty, Mayor University,*
Camino La Pirámide 5750, Huechuraba, Santiago, Chile

* Correspondence to: *hugo.madrid@umayor.cl*

Abstract—A new hyphomycete, *Harmoniella campanaensis*, is described from submerged dicotyledonous leaves collected in La Campana National Park, central Chile. This fungus is the second taxon described in *Harmoniella* and the only one known from the Americas. *Harmoniella campanaensis* differs from the generic type, *H. chrysocephala*, by producing much longer conidiophores (with stipes up to 850 µm) and shorter conidia (3–5 µm long).

Key words—conidial fungi, sympodial development, taxonomy

Introduction

During June 2015, fieldwork was carried out in central Chile with the aim to collect saprophytic microfungi from soil and plant material. One of the sampled sites was La Campana National Park (Valparaíso Region), a vast protected area with a Mediterranean climate and a rich endemic flora consisting of a hygrophilous laurifolious forest dominated by species such as *Aristotelia chilensis* (Molina) Stuntz, *Beilschmiedia miersii* (Gay) Kosterm., and *Cryptocarya alba* (Molina) Looser (Elórtegui & Moreira-Muñoz 2002). Although we were mainly interested in graminicolous helminthosporioid genera (Madrid et al. 2014, Manamgoda et al. 2014), many other interesting hyphomycetes were also found, including new species and new records.

One interesting fungus was obtained from submerged dicotyledonous leaves. Under the stereomicroscope, it showed conspicuous erect conidiophores with a vesicle at the apex and produced masses of dry ochraceous conidia resembling an *Aspergillus* species. However, the fungus produced conidiophores with

strongly pigmented stipes and a tendency to proliferate percurrently through old vesicles. A more detailed observation with light microscopy showed that it produced septate conidiophores and sympodial, strongly denticulate conidiogenous cells. Morphological features place this taxon in the monotypic genus *Harmoniella* V.N. Boriss. (Borisova 1981, Seifert et al. 2011). However, the dimensions of conidiophores and conidia and the substrate from which it was isolated clearly indicate that it is different from the generic type, *H. chrysocephala* V.N. Boriss.

Materials & methods

Submerged decaying leaves, twigs, and wood were collected in a stream in La Campana National Park, Valparaíso Region, Central Chile. Samples were placed in sterilized polyethylene bags, transported to the laboratory and kept at 4°C until processed. The samples were placed in moist chambers, incubated at room temperature and observed weekly for two months. Isolation of the studied *Harmoniella* species was attempted by transferring conidia from conidiophores on the natural substrate to Petri dishes containing either cornmeal agar, oatmeal agar, Sabouraud agar (all manufactured by Becton Dickinson, USA), or water agar; the water agar plates were prepared with or without sterilized pine needles or maize leaves. The morphological study was carried out from lactophenol mounts using a Zeiss AxioScope A1 light microscope. A specimen was deposited in the Herbarium of the National Natural History Museum, Santiago, Chile (SGO).

Taxonomy

Harmoniella campanaensis Madrid, D. Torres & V. Silva**, sp. nov.** Plate 1

MycoBank MB 815759

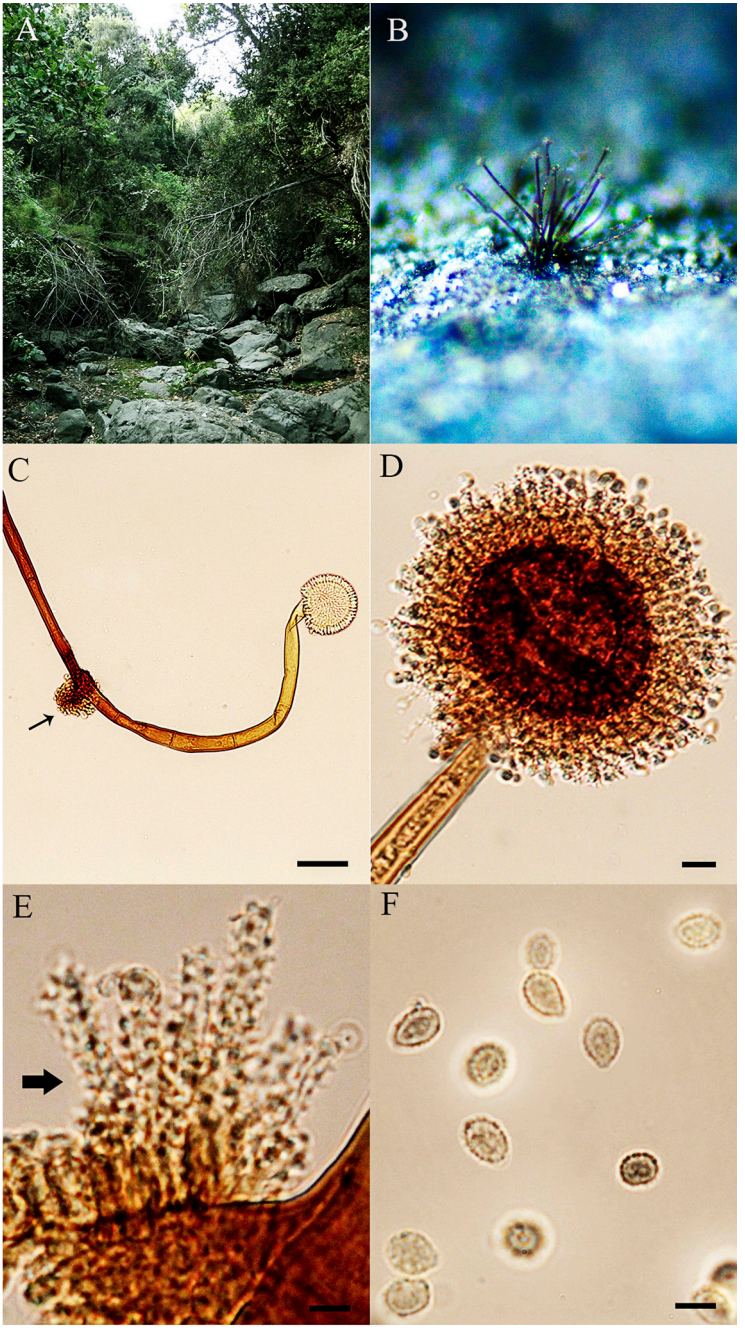
Differs from *Harmoniella chrysocephala* by its much longer conidiophores, which often proliferate percurrently, and by its shorter conidia.

Type: Chile, Marga Marga Province, La Campana National Park, El Granizo area, on submerged decaying dicotyledonous leaves, 30 Jun 2015, H. Madrid (**Holotype**, SGO 166366, dried leaf).

Etymology: *campanaensis* refers to the place where the fungus was collected, La Campana National Park.

Vegetative hyphae septate, branched, light olivaceous brown, smooth, up 4 µm wide. Conidiophores macronematous, mononematous, solitary to caespitose, often proliferating percurrently, straight to slightly flexuous, septate, light olivaceous brown to dark reddish brown, thick-walled, with a

Plate 1. *Harmoniella campanaensis* (holotype, SGO 166366). A. Sampling area in La Campana National Park; B. Conidiophores on the natural substrate; C. Conidiophore showing percurrent proliferation (arrow); D. Vesicle and conidiogenous cells; E. Sympodial conidiogenous cells with denticles (arrow); F. Conidia. Scale bars: C = 50 µm; D = 10 µm; E, F = 5 µm.


A
B
C
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subcylindrical stipe and a well-developed vesicle at the apex; stipe 688–850 × 11.5–22 µm, sometimes broadened up to 35 µm toward the base; vesicle globose to depressed-globose, light olivaceous brown when young, dark brown at maturity, 44–59.5 µm wide. Conidiogenous cells covering the vesicle radially, forming a compact single layer, subcylindrical, 12–18.5 × 3–4 µm, with numerous denticles up to 2 µm long. Conidia dry, aseptate, ellipsoid to dacryoid, verruculose to echinulate, light olivaceous to light olivaceous brown, ochraceous in mass, 3–5 × 2.5–4 µm.

Comments: All attempts to obtain this fungus in culture were unsuccessful, despite the use of different media. Therefore, no DNA sequence analyses could be carried out and its phylogenetic placement remains unknown. Borisova (1981), in the description of the type species, also pointed out its inability to grow in vitro. *Harmoniella chrysocephala* was described from pine needles in Yalta, Ukraine, and we could not find any record of this species from a different country; the Global Biodiversity Information Facility (www.gbif.org) yields no records of *H. chrysocephala* outside the type locality. *Harmoniella chrysocephala* differs from *H. campanaensis* by its much smaller conidiophores (150–170 × 12–17 µm) and longer conidia (6–7.2 × 3.6–4.8 µm), which are more irregular in shape (Borisova 1981). In addition to these differences, the dissimilar habitats (pine needles versus submerged dicotyledonous leaves) and the tendency of the Chilean fungus to develop percurrently proliferating conidiophores prompted us to propose this organism as a taxonomic novelty.

Harmoniella has been listed, with some doubt, as a possible synonym of *Pseudogibellula* Samson & H.C. Evans (Seifert et al. 2011). *Pseudogibellula* is monotypic and based on *Gibellula formicarum* Mains [≡ *P. formicarum* (Mains) Samson & H.C. Evans], the asexual state of *Torrubiella pseudogibellulae* Samson et al., a member of *Clavicipitaceae* (Mains 1949, Samson & Evans 1973). We prefer to treat *Harmoniella* as a separate genus due to important ecological and morphological differences. *Pseudogibellula* is an entomopathogen that attacks insects and arachnids whereas *Harmoniella* species are associated with decaying plant material (Seifert et al. 2011). Furthermore, the structure of the conidial apparatuses is quite different; *Harmoniella* has mononematous smooth conidiophores with wide vesicles, which are covered directly by conidiogenous cells, while *Pseudogibellula* produces synnemata and verrucose conidiophores with very small vesicles (4–6 µm wide), covered by two series of metulae (Samson et al. 1988). Conidiogenous cells are also dissimilar, showing conspicuous denticles in *Harmoniella* but only minute scars in *Pseudogibellula* (Seifert et al. 2011).

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